MARINE REVIEW.

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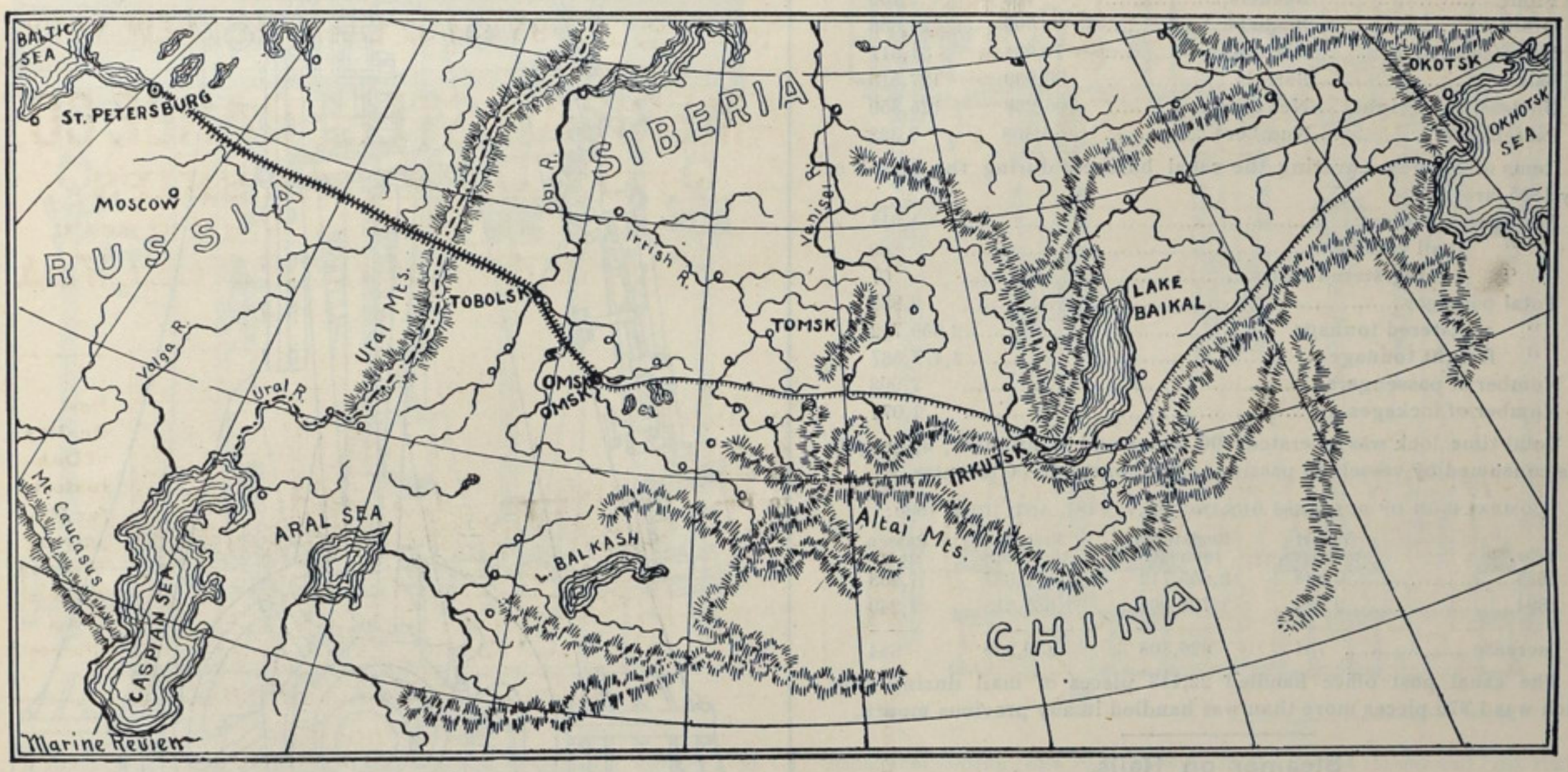
Car Ferries for Siberia.

There is no advertising scheme in the Detroit Dry Dock Co.'s negotiations with the Russian government to design and superintend the construction of immense car ferries for service in Siberia. While the navy department has been sending the big cruiser Columbia on a fast trip from Southhampton to New York, and is contemplating ordering the Minneapolis to Japan to advertise American progress in ship building, this lake firm has been quietly making arrangements with Russian engineers, whereby it is proposed to furnish plans and send men to Siberia to superintend the construction of two and possibly five ice-crushing car ferries, similar to, but larger, than the St. Ignace, which has been engaged in the Straits of Mackinac for some time past, and which, with three tracks, is capable of carrying eighteen loaded freight cars, sometimes crushing through solid ice 27 inches thick in mid-winter and seldom encountering a single day's delay in the service.

It is, of course, well known that one of the greatest public works of the Russian government at this time is the construction of a military railway across Siberia, which will connect St. Petersburg with Okhotsk sea on the Pacific. The construction of this railway is an undertaking of great magnitude, and its importance commercially, as well as from a military point of view, may be best understood by a glance at the accompanying map, which will give an idea of the immense territory to be traversed. The heavy line on the engraving shows the railway constructed to Omsk in Siberia, while the light line shows the course to be followed across Lake Baikal on the way to the Pacific. It is necessary to cross this lake, in order to avoid construction of the road through mountainous regions. Lake Baikal does not appear very large on the map, but it is about the size of Lake Erie, and for a period of about three months of the year ice forms rapidly and is very thick, the themometer sometimes registering 40 degrees below zero.

The problem of carrying trains of cars across this lake caused the Russian government to send engineers to the lakes to investigate and report upon the work of the big car ferries at Mackinaw, and to open up negotiations with the builders, the Detroit Dry Dock Co., to superintend the construction of similar boats in Siberia. Three parties of engineers, the last of them in the direct employ of the Russian government, have visited Mackinaw and the works of the dry dock company within the past few months, and as a result of propositions made to them, Messrs. Frank E. Kirby and Gilbert N. McMillan are now in St. Petersburg, and it is expected that contracts will be closed this week. The vessel's hulls will of course be built at Lake Baikal where they are to be used. Matters pertaining to the construction of machinery, etc., are not as yet fully decided upon, but the important feature, that of the dry dock company designing all parts of the boats and superintending the work, is as well as settled.

Engravings and a full description of the St. Ignace, after which these boats are to be patterned, will be found in the REVIEW of April 5, 1894.



Discouraging High Speed in Narrow Channels.

In accordance with resolutions adopted at the last meeting of executive officers of the Lake Carriers' Association in Cleveland, Secretary Keep has sent out another circular regarding high speed in narrow channels, in which he says:

"The prevailing low freights and the change in the regulations governing the navigation of the St. Clair Flats canal have produced an alarming increase in the speed of steam vessels in the narrow and dangerous cuts in the Detroit, St. Clair and St. Mary's rivers. Vessel masters report that many vessels are running at unsafe speed through the Lime-Kiln crossing, the Hay lake channel, the St. Clair Flats canal, and other narrow channels. Unless this reckless navigation is checked at once some serious accident will happen at one of these places and the entire lake commerce may be blockaded thereby. Owners of steam vessels belonging to the Lake Carriers' Association are therefore requested to impress again upon their masters the importance of exercising the greatest caution at the points above mentioned, and particularly the necessity of reducing the speed at these points."

Copies of the circulars will be furnished by members of the Lake Carriers' Association to vessel masters.

In a circular urging vessel owners to resist all efforts of Buffalo hard coal shipments to break up the fueling agreement, Secretary Keep of the Lake Carriers' Association says: "Except for the voluntary agreement of vessel owners not to take fuel from hard coal shippers, directly or indirectly, vessels chartered for coal at Buffalo have been and are now permitted to buy their fuel where they please. It has not been necessary for vessels seeking coal charters at Buffalo to fuel at the port of Buffalo, and many of them have taken cheaper fuel at other ports. The price of fuel at Buffalo this season has been fully forty cents per ton lower than last season, with an improvement in quality. Surely this is a most successful outcome of the struggle. In addition to these advantages, vessel owners have acquired new confidence in their ability to stand together, and to right their wrongs by united action."

Corrigan, McKinney & Co. of Cleveland have bought the Crystal Falls mine but there is no truth in the report of their having purchased the Windsor.

Canal Tonnage will Exceed Fifteen Millions.

Each monthly report from the St. Mary's Falls canal tends to confirm the belief that the freight tonnage of the canal this season will exceed fifteen millions. Up to and including July 31 (practically three months of the season) the aggregate of freight passed through the canal was 6,376,-412 net tons, of which, 5,393,065 tons was east bound and 983,347 tons west bound. The July statement of canal business again exceeds in nearly every item all previous records for a single month. Following is a discussion of the canal business from the opening of navigation to August 1 during the seasons of 1894 and 1895:

ST. MARY'S FALLS CANAL TRAFFIC—OPENING OF NAVIGATION TO AUGUST 1, SEASONS OF 1894 AND 1895.

EAST BOUND.

Freight items.	Designation.	To August 1, 1894.	To August 1, 1895.
Copper	Net tons	44,291	53,992
Corn	Bushels	1,222,246	2,859
Building stone	Net tons	12,401	12,520
Flour	Barrels	3,360,410	3,540,807
Iron ore	Net tons	3,077,623	4,010,540
Iron pig	Net tons	10,421	12,037
Lumber	M. ft. B. M.	325,966	357,180
Silver ore	Net tons	372	100
Wheat	Bushels	10,832,506	8,959,991
Unclassified freight	Net tons	57,937	73,609
Passengers	Number	6,208	7,081
WEST BOUND.			
Coal, anthracite	Net tons	245,892	143,893
Coal, bituminous	Net tons	286,785	662,630
Flour	Bushels	753	150
Grain	Bushels	500	28,650
Manufactured iron	Net tons	10,034	31,317
Salt	Barrels	80,699	127,515
Unclassified freight	Net tons	106,269	125,350
Passengers	Number	6,468	7,322

Items of interest covering the canal business during the month of July 1895, are:

Passages, steamers	1,911
" sail vessels	860
" unregistered crafts	67
Total passages	2,838
" registered tonnage	2,655,712
" freight tonnage	2,477,587
Number of passengers	7,903
Number of lockages	1,071

Total time lock was operated, 700 hours and 33 minutes; aggregate time consumed by vessels in passing, 1,628 hours and 50 minutes.

COMPARISON OF BUSINESS DURING JULY, 1894, AND JULY, 1895:

Year.	Vessel passages.	Registered tonnage.	Freight tonnage.	Passengers.
1895	2,838	2,655,712	2,477,587	7,903
1894	2,084	1,728,904	1,637,618	7,249
Increase	754	926,808	839,969	654

The canal post office handled 22,113 pieces of mail during July, which was 1,975 pieces more than was handled in any previous month.

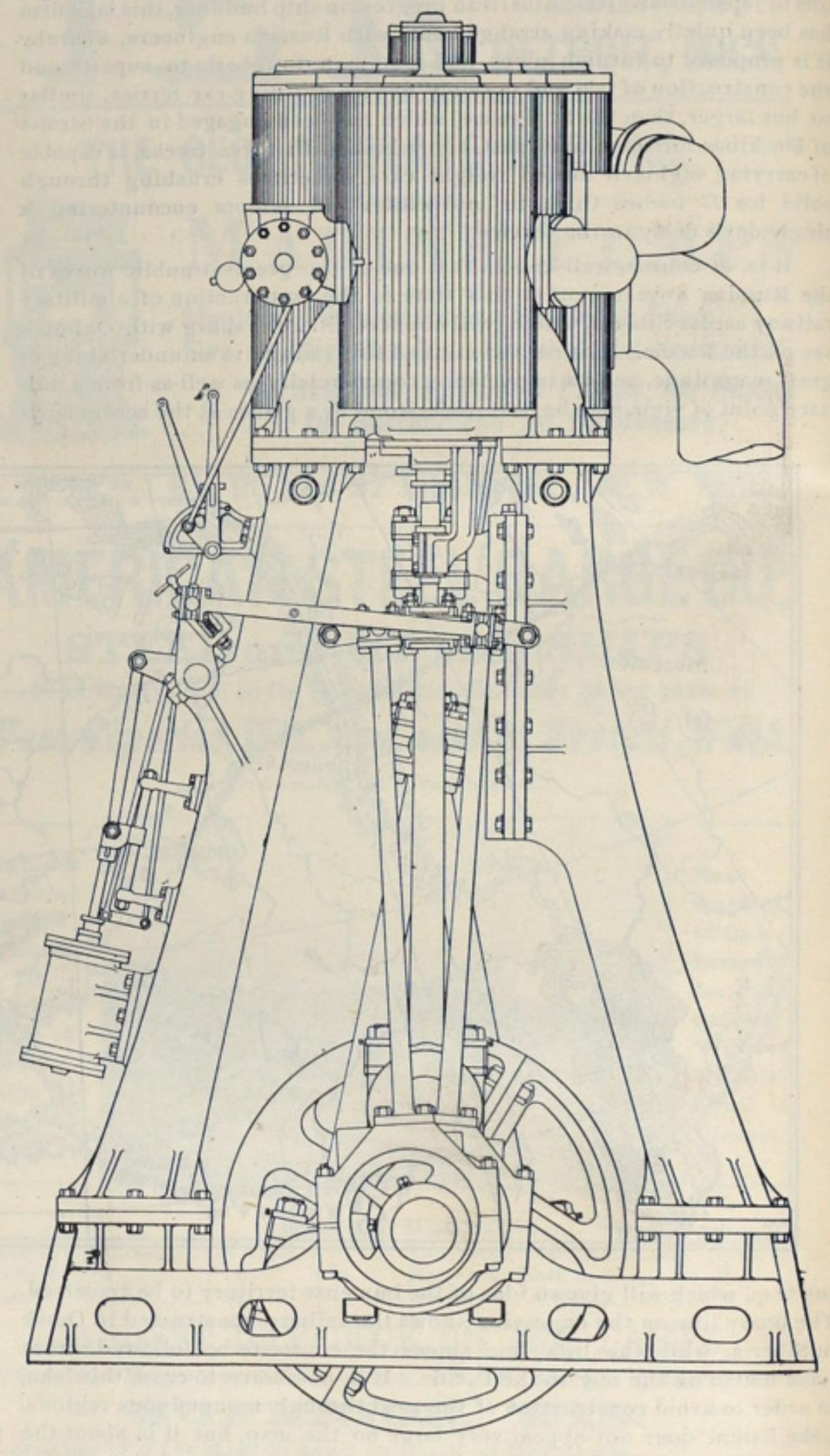
Steamer on Rails.

An interesting steamer is just about to be started on some lakes a few miles distant from Copenhagen, the peculiar feature being that the steamer has to make a short journey overland, the two lakes being divided by a strip of land. Across this a railway has been constructed, crossing a high road, which necessitates a gradient on both sides of one in fifty, the metals being ordinary rails. At the two ends the rails have been carried into and under the water on a wooden structure. By means of piles the steamer is guided on to the rails, which correspond in position with two wheels fixed on each side of the steamer. The steamer then goes onto the rails at full speed and travels up the rails on the one side and down the incline on the other, into the water, where the propeller again takes over its function. The engine is comparatively powerful, and in addition to the usual propeller shaft there is another shaft, which by means of a chain, works the small wheels on which the steamer crosses the rails. The boat has also a powerful brake to moderate its speed down the incline. The steamer is 44 feet long, capable of holding seventy passengers, and the engine indicates twenty-seven horse power. All the trials have passed off perfectly satisfactory.

In another part of this issue Gen. Poe advertises several extensive dredging jobs, and Major Adams calls for bids on twenty-two 10-inch steam fog whistles.

One of Wheeler & Co's. Best Ships.

Engines of one of the most successful steel freighters afloat on the lakes are illustrated herewith. Since F. W. Wheeler & Co. of West Bay City, Mich., have been operating a modern engine building plant, suited to the construction of marine machinery of the largest kind, some of the freight steamers turned out by the company have proven highly satisfactory to their owners. The steamer John J. McWilliams, one of the latest of these boats in commission, was built for W. H. Gratwick of Buffalo and Capt. John Mitchell of Cleveland, from design made by S. Anderson, engineer with the Wheeler company, and is now on her twelfth trip in the ore trade between Ashland and South Chicago. She did not leave the yard of the builders until May 4, so that twelve cargoes have been delivered in four months. On the Sault draft of 14 feet the McWilliams carried on her last trip 3,289 gross tons of ore, and she was loaded with one cargo of 3,060

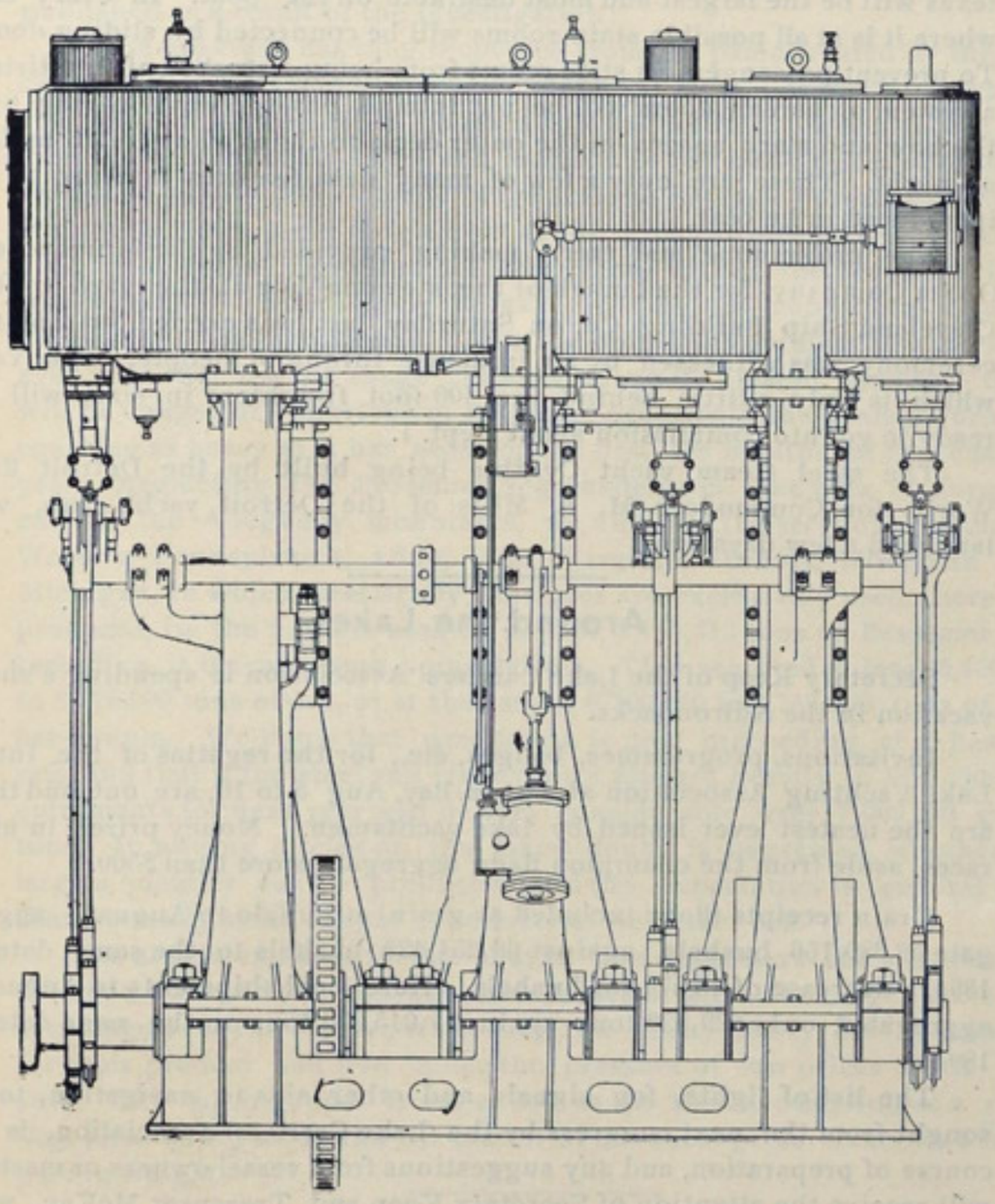


tons in fifty-two minutes. These records are due to the fact that in her construction everything that would facilitate quick dispatch and large carrying capacity was sought and appearance sacrificed to obtain this end. Her owners are of the opinion that although much smaller than the 400-foot steamers now under way at several lake yards, she will carry freight as cheaply as any of them. The detailed description and drawings of the steamer's engines will, therefore, prove more interesting than plans of the boat itself, which would show only the ordinary type of lake freighter.

The McWilliams is of the following dimensions: Length, over all, 370 feet 6 inches; length of keel, 352 feet; beam, moulded, 44 feet 6 inches; depth, moulded, 26 feet 3 inches. She is two masted, schooner-rigged, with foremast well forward and mainmast aft of stack, and has no deck houses, thus giving her a clear deck space with nothing in the way of ten hatches. Throughout the whole ship nothing but the best material was used and she was built to comply with the Bureau Veritas rules. She

was built on the bulb-angle principle, with frames spaced 24 inches apart. The water bottom is built on the cellular system and is 4 feet 6 inches deep, divided into four compartments on each side. There is no plating on main deck with the exception of stringer plates at sides and tie plates. The cabins are of the regular barge style, with the pilot house and texas well forward, as are also the quarters for the captain, mates, wheelmen and watchmen. The dining room, kitchen and quarters for the engineers and balance of the crew are in the cabin aft. The pilot house and texas are finished in gum wood and all other cabins in oak. The boat is supplied with Williamson Bros. steam steerer, located aft of the engine room. The latest design of the American Ship Windlass Co's. windlass and capstan is located forward and a capstan of the same make is aft. Anchors are of the Vulcan stockless type and weigh 3,500 pounds each, with 1¾-inch cables.

As has been noted, the engines for this steamer were designed and built at the company's shops, and are of the vertical triple expansion type in common use on lake steamers. The cylinders are 20, 32½ and 55 inches in diameter with 42 inches stroke, and are placed in the order of high, intermediate and low pressure. The high and intermediate cylinders have piston valves and the low pressure cylinder has a balanced, double-ported slide valve, with a common travel of 6½ inches. All valves are worked by the Stephenson double-bar link motion, with adjustable cut

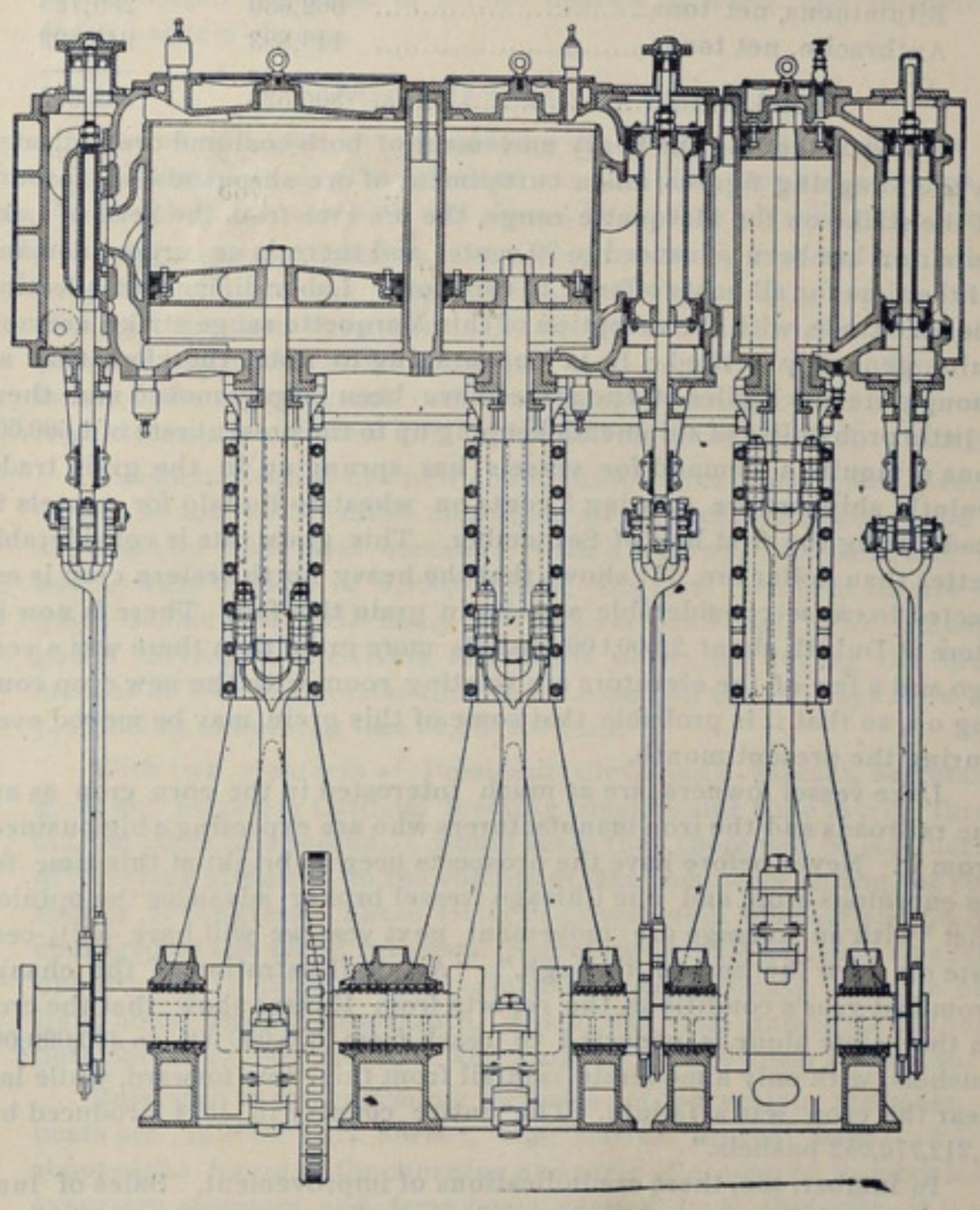


off arrangement. The reversing gear consists of a steam cylinder 10 inches in diameter by 15 inches stroke, with differential valve motion controlled by a lever at the engine platform. The pistons are of cast iron with self-setting spring rings. The piston rods are 5 inches diameter, of machinery steel, with tapered ends and nuts at pistons and cross heads. The cross heads are of wrought iron, with double gudgeons, and slippers forged on. The connecting rods are 8 feet centers, with upper ends forked to suit cross heads and usual bolt connections. The bed plate is of the box girder type, cast in one piece with five main journals. The frame work consists of three straight cast iron columns with all necessary brackets on front side and three Y-shaped columns with large bearing surface for slippers on the rear. The columns on both sides are securely fastened together by means of a wrought iron tie rod, and the cylinders are bolted together in such a manner as to allow free expansion. The crank shaft is wrought iron of the built up type, with cranks at an angle of 120 degrees in the order of high, low and intermediate. The crank pins are 11 inches diameter by 12 inches long, and both crank pin brasses and main journals are lined with anti-friction metal. The thrust shaft is 11 inches diameter, with four thrust collars 17½ inches diameter, 2¾ inches thick and 4¾ inches space between. The thrust bearing is of the horse-shoe type, with four collars faced with anti-friction metal and adjusted by means of bolts and nuts. The propeller shaft is 11 inches diameter, and 11½ inches diameter in stern bearing. The stern bearing consists of a cast iron sleeve in two halves, 4 feet 4 inches long, with the bottom half lined with lignum vitæ. The propeller is a sectional one, 13 feet diameter and 16 feet pitch, and is of Wheeler & Co's. design. The condenser is of the Worthington independent type, 12 inches by 17 inches by 15 inches, and all pumps are of the same make.

Steam is supplied at a pressure of 170 pounds by two return-tubular boilers, 13 feet 6 inches diameter and 12 feet long, with three 43-inch furnaces in each. Each boiler has 2,423 square feet of heating surface and 66.3 square feet of grate. Forced draught is supplied by two of the Buffalo Forge Co's. 60-inch fans with a 4 by 4½-inch attached double vertical engine.

Salaries of Steamboat Inspectors.

A note in the last issue of the REVIEW referred to a dispatch from Washington in which Gen. Dumont, chief of steamboat inspection service, was quoted as saying that the only changes in salaries of local inspectors on the lakes, as a result of the salary bill passed by the last congress, will be an increase from $1,800 to $2,000 for the inspectors at Port Huron and Grand Haven. Doubt was expressed as to the correctness of this statement, but Gen. Dumont sends us an explanation of the matter. Changes were made in the salaries of several inspectors on the lakes when the law went into effect on March 1 last, but the only further changes on the lakes in accordance with the report of inspections for the



fiscal year ending June 30, 1895, were in the Grand Haven and Port Huron districts, as stated. Gen. Dumont says:

"Your comments regarding the Washington dispatch arise, I assume, probably from the fact that you have overlooked the terms of the law approved March 1, 1895, which required the salaries of inspectors to be rated March 1, 1895, from the year preceding that date, and again for the fiscal year ended June 30, 1896, and each fiscal year thereafter, according to the number of steamers inspected in each district in each preceding year. Under the rating of March 1, 1895, the salaries of the inspectors at Marquette were raised from $900 to $1,500, at Grand Haven, from $800 to $1,800; Buffalo, from $2,000 to $2,250; Cleveland, from $1,500 to $2,250; Detroit and Port Huron, Mich., reduced from $2,000 to $1,800; Chicago and Milwaukee, $2,000 each, same as formerly.

Under the new rating, July 1, for the fiscal year ending June 30, 1896. Port Huron and Grand Haven have gone up from $1,800 to $2,000. There was no change in the other districts named, for the reason none was called for under the law since the rating of March 1, 1895.

Both of the proprietors of the Queen City Metal Co., Buffalo, are practical marine engineers. Henry M. King was in the Western liner Buffalo, and Robert Walker was in the Anchor liner Deleware before going into business.

Ore and Coal Shipments—Freight Matters.

Ore shipments from all upper lake ports—Duluth, Superior, Two Harbors, Ashland, Marquette and Gladstone—to August 1 aggregate 4,983,270 gross tons, as compared with 3,600,320 gross tons on Aug. 1, 1894. These figures represent a movement thus far this season of about 1,600,000 tons a month, and an increase to date of 1,382,950 tons.

Figures regarding coal shipments to Lake Superior are also available from the St. Mary's Falls canal reports. These reports show that during May, June and July of this year (the canal was open only a few days in April) the shipments of bituminous coal amounted to only 662,630 net tons, against 286,785 net tons for the same period in 1894, or a gain thus far this season of 375,845 tons. On the other hand there is a decrease of 101,999 tons this season in anthracite shipments through the canal to August 1. Shipments of bituminous coal through the canal during July, just passed aggregated 432,873 tons. In comparing soft coal shipments this year with those of a year ago it must be remembered, of course, that until late in July a year ago soft coal miners were on strike, and the soft coal trade of the northwest had been depending upon stocks carried over from shipments of 1893.

SHIPMENTS TO LAKE SUPERIOR THROUGH ST. MARY'S FALLS CANAL.

	To August 1, 1895.	To August 1, 1894.
Bituminous, net tons	662,630	289,785
Anthracite, net tons	143,893	245,892
Total	806,523	532,677

Notwithstanding the heavy movement of both coal and ore indicated by the foregoing figures, and a curtailment of ore shipments on account of the strike on the Marquette range, the ore rate from the head of Lake Superior has been advanced to 90 cents; and there is an urgent demand all the time for all boats offered to carry ore. Labor difficulties affecting the lake trade, with the exception of this Marquette range strike, are now quite generally settled. It is encouraging to note, therefore, that although ore stock piles at the mines have been largely moved and there is little probability of shipments keeping up to the present rate of 1,600,000 tons a month, a demand for vessels has sprung up in the grain trade. Duluth shippers are offering 3 cents on wheat to Buffalo for vessels to load during the first half of September. This grain rate is considerably better than dollar ore. It shows that the heavy northwestern crop is expected to cause considerable activity in grain this fall. There is now in store at Duluth about 2,500,000 bushels more grain than there was a year ago and a few of the elevators are wanting room with the new crop coming on, so that it is probable that some of this grain may be moved even during the present month.

Lake vessel owners are as much interested in the corn crop as are the railroads and the iron manufacturers who are expecting a big business from it. Never before have the prospects been so bright at this time for an enormous crop, and one Chicago vessel broker advances the opinion that "with an average ore movement next year we will have a 2½-cent rate on corn the season through." "As an illustration of the change from last year's conditions, the reports from Kansas show that the crop in that state alone is expected to reach from 375,000,000 to 400,000,000 bushels, with only a moderate rainfall from this time forward, while last year the crop was a failure. The entire country in 1894 produced but 1,212,770,052 bushels."

In lumber, too, there are indications of improvement. Sales of lumber at Duluth have been very heavy during the past ten days and all advices from the head of Lake Superior are to the effect that the situation in lumber freights is more promising than it has been at any time before this season. A further advance in lumber freights is almost certain to occur if lumber boats now trading in ore are not diverted to lumber. Of course, only this season's cut is being offered at present, and lumber has dried very slowly, as it has rained in the Lake Superior lumber region almost every day since the first of June. Lumber shipments through the St. Mary's Falls canal to August 1, which represents, of course, the entire Lake Superior movement to that date, aggregated 357,180,000 feet, against 325,966,000 feet on the same date a year ago.

Among the Ship and Engine Builders.

Another change of designing engineers follows the announcement of Walter G. Miller's resignation from the Globe company. It is understood from a source that seems entirely reliable that Henry Penton, who has for some time past been engaged as constructing engineer with the Frontier Iron Works of Detroit, and who designed while with that company some of the best engines in lake steamers, has accepted a position with S. F. Hodge & Co. of Detroit. During the past three years Hodge & Co., have been making extensive alterations and additions to their plant and they now have probably the best equipped marine engine works on the lakes.

All details regarding cabins, staterooms, crew's quarters, etc., in the big side-wheel steamer which the Detroit Dry Dock Co. is building for the Cleveland & Buffalo Transit Co. have not as yet been fully decided upon, but Manager Newman of the transit company has plans from the builders and is now making final decisions. This boat will, of course, be patterned largely after the big steamers of the Detroit & Cleveland line, but both Mr. Kirby, the designer, and Mr. Newman, who has been connected with side-wheel passenger boat service from boyhood, are introducing many new features for the convenience of passengers. One of the most important of these is a broad staircase leading down to the dining-room from the main vestibule of the boat where the clerk's offices, baggage room, etc., is located. This staircase will be similar to the wide entrance that leads up to the main cabin, but there will still be eight feet left on either side of it for entrances to the after parlor on the main deck. Provision will be made so that this after parlor may also be used as a dining room, or small banquet hall, when it is desired to accomodate special parties in numbers running up to forty. The number of state rooms now planned for the boat is 158, of which eighty-seven will be on the principal cabin deck and seventy-one will have entrances from the galley that surrounds the main cabin. In addition to these there will be six big parlor staterooms having brass bedsteads with bath rooms, the latter being so arranged that one bath will be suited to accomodate two parlors. Four of these parlors are entered from the main cabin aft, and two are just aft of the Texas on a line with the upper tiers of the state rooms. These two rooms near the texas will be the largest and most desirable on the boat. In every case where it is at all possible state rooms will be connected by sliding doors. To prevent passengers in state rooms from being disturbed after retiring, a system of screen doors will be put into all passage ways leaving only the bow and stern spaces on the outer deck to those who remain up late at night. These are only a few of many new features that are to be introduced in he boat.

The programme and merry-making provided by the Murray-Lane Opera Company for the launch of the steamer Yale at the yard of the Cleveland Ship Building Co. on Saturday last was carried out, and the ceremony was witnessed by an immense throng of people. The Yale, which is only a little behind the 400-foot freighters in size, will be ready to go into commission about Sept. 1.

The steel steam yacht Cynthia being built by the Detroit Boat Works for Commodore M. B. Mills of the Detroit yacht club, was launched a few days ago.

Around the Lakes.

Secretary Keep of the Lake Carriers' Association is spending a short vacation in the Adirondacks.

Invitations, programmes, badges, etc., for the regattas of the Inter-Lake Yachting Association at Put-in-Bay, Aug 5 to 10, are out, and they are the neatest ever issued by lake yachtsmen. Money prizes in nine races, aside from the champion flags, aggregate more than $500.

Grain receipts (flour included as grain) at Buffalo to August 1, aggregate 52,680,156 bushels, against 66,254,420 bushels to the same date in 1894, a decrease of 13,574,264 bushels. Hard coal shipments to August 1 aggregated only 829,829 tons against 1,045,070 tons on the same date in 1894.

The list of lights, fog signals and other aids to navigation, to be sought from the next congress by the Lake Carriers' Association, is in course of preparation, and any suggestions from vessel owners or masters will receive the attention of Secretary Keep and Treasurer McKay, who have the matter in charge for the present.

Scarcely a week passes that Capt. McKay of Cleveland does not receive inquiry of some kind from inventors of wrecking devices who are figuring on raising the steamer Pewabic. Thirty years ago Friday of this week, about 9 o'clock at night, the Pewabic went down near Thunder Bay island, Lake Huron, after collision with the steamer Meteor.

Four new steam vessels from the lakes were registered in the office of the United States commissioner of navigation last week. They are: Victory, Cleveland, 3,774.90 tons gross, 3,339.90 tons net, No. 161,758; Queen Anne, Detroit, 14.53 tons gross, 9.88 net, No. 20,610; Geo. Farwell, Detroit, 750.86 tons gross, 599.40 net, No. 86,323; Cambria, Milwaukee, 48.32 tons gross, 24.16 net, N. 127,100.

Paul Huebner of Milwaukee, inventor of the egg-shaped life boat which was built some time ago by the Detroit Boat Works, will build another boat of the same type, in which he intends to cross the ocean and visit Germany, England, France and Russia. Should he succeed he will be the first man to accomplish the feat of crossing the ocean in a life boat. He will come to Detroit the first part of next month and begin work on the boat, which will be 50 feet long, 8 feet high and 10 feet beam. It will contain a 100-horse power gasoline engine and will hold 100 persons. He says that the first boat built in Detroit was an experiment, which has proved so successful, that he intends trying to induce maritime countries to adopt his invention for life saving service—Detroit Free Press.

Ore Business for 1896—Bessemer Must Advance.

It is probable that about $1 a ton above last winter's prices will be asked this fall by companies producing Bessemer ores. About half of this advance will be attributed to higher labor costs, better lake freights, additional railway and dock charges, etc., and the other half to a profit for the ore producer who has been working on very low margins for two or three seasons past. If such an advance is secured, a healthy business feeling will be imparted to the lake trade and to all branches of the iron industry. There will, of course, be the usual resistance from furnacemen, but a substantial advance, whether it is a dollar or not, is certain for the Bessemer product, and it is quite probable that the great bulk of the ore to be brought down next season will be sold and covered by lake freight contracts before navigation is at an end in December.

The fact that Bessemer ore must, with a continuance of the present activity in the iron business, bring higher prices is gradually dawning on the furnace owners, who realize that the Mesabi range, for various reasons, is not the competitor that it was expected to be, and that available supplies of standard ores are at least not more than equal to the demand. Representatives of the Iron Age, a journal that has published a great deal of correspondence from Duluth exaggerating conditions on the Mesabi, have recently returned from a trip of investigation on the range, and the following is an extract from an article on the ore situation published as a result of the investigation:

"The ore trade has long recovered from the panic created by the first realization of the wonderful magnitude of the Mesabi deposits. It may be stated that the pressure of competition has shifted. When at first the ores were proclaimed to be, and were quite generally believed to be, of Bessemer quality, the Gogebic range and the Bessemer properties on the Marquette range were singled out as the greatest prospective sufferers. That part of the Vermilion ore that comes within the Bessemer limit was regarded as safe, largely because its physical conditions made it necessary to the furnacemen. Now the opinion is gaining ground that, even with the Mesaba range running full to its present capacity, there will be danger of a shortage of Bessemer ore should the demand for steel continue as heavy as it has been for the first six months of the current year. Neglecting the Bessemer pig made from lake ores at furnaces east of the Allegheny mountains, we find that the territory including Western Pennsylvania, Ohio, West Virginia, Illinois, Wisconsin and Michigan, in which, practically, lake ores are exclusively used, there was produced, in the first six months of 1895, 2,115,613 tons of Bessemer pig, including, it is true, some spiegeleisen. This required at least 3,450,000 to 3,375,000 tons of ore, or at the rate of 6,700,000 to 6,750,000 tons of ore per annum. We know that production is now proceeding at a heavier rate, and that if the steel rail trade comes forward heavily in 1896 the requirements for next year will be very considerably over 7,000,000 gross tons. In mining circles on the lakes doubt is expressed whether so large a quantity can be produced, and the expectation is general that there is really some danger of scarcity of Bessemer ore."

The article explains further that in non-Bessemers the situation is different, but even the non-Bessemer mines of the older ranges have an advantage over the Mesabi, since they can pretty nearly fill the demand for their product and live under the pressure of low prices made this year. The mining cost is not as low as the Mesabi cost, but, as a rule, they have no royalties and the matter of distance gives them an advantage in freights.

Steel Shafts, Piston Rods, Etc.

In their efforts to have lake ship and engine builders appreciate the merits of steel shafting, etc., Messrs. Fisher & Porter of Chicago, western sales agents for the Bethlehem Iron Company, are showing some very strong recommendations from eastern ship builders and from the Union Iron Works of San Francisco. President Irving M. Scott of the Pacific concern, writing under date of July 19, says:

"The first materials of the Bethlehem Iron Co. that we used were the crank and propeller shafts for the United States cruiser San Francisco. The requirements called for 68,000 pounds tensile strength and 28 per cent. elongation. This was exceeded in every shaft, some of them going as high as 73,000 pounds and 33 per cent. elongation, requiring a special request by the Union Iron Works to the secretary of the navy to permit of their being used, on account of having exceeded the limit allowed by the specifications, being at that time better than any shafts known. Since then we have had the shafts for the sea-coast monitor Monterey and for the cruiser Olympia, whose engines developed 18,800 horse power, which was distributed to the propeller by two shafts, making 140 revolutions per minute. These shafts were made by your company, and for their size and sectional area have probably delivered the largest horse power of any shaft in the American navy. We had also shafts for the battleship Oregon; diagonal armor and turret armor for the 13-inch guns for this battleship; also a crank shaft, three-throw, single piece, for the steamer Pomona; propeller shafts for the steamers Australia and State of California; crank shafts and piston rods for four 1,200 horse power electric light engines; piston rods, oil tempered, for a street railway company of this city; crank shafts and piston rods for an 1,800 horse power electric light engine; piston rods, oil tempered, for another of the street railway power houses here, and hollow and oil tempered piston rods for 900 horse power engines for running electric generators at Butte, Mont. All of these have been of the very highest grade of material and most satisfactory in their results."

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Aug. 3, 1895:

	Wheat, bushels.	Corn, bushels.
Chicago	15,564,000	1,837,000
Duluth	6,310,000	.....
Milwaukee	235,000	.....
Detroit	250,000	86,000
Toledo	1,001,000	121,000
Buffalo	1,295,000	205,000
Total	24,655,000	2,249,000

As compared with a week ago, the above figures show at the several points named a decrease of 197,000 bushels of wheat and an increase of 41,000 bushels of corn.

Miscellaneous Mention.

Boston will soon have a floating life saving station. Besides being fully equipped as all other stations are, it will be supplied with two naphtha launches, one of which will always be on duty patroling the harbor.

Engineering of London is at present printing a series of articles descriptive of Clydebank ship building and engineering works. All machinery of modern invention is illustrated and the article as a whole will prove as instructive as an extended visit to the works. The July 19 issue of the same journal contains a lengthy article with large engravings descriptive of the lift bridge at Van Buren street, Chicago.

Russia in Europe has now about 35,000 miles of navigable rivers and canals, or about 6,000 miles more than all the rest of Europe; and these are used by 1,300 river steamers, with a total of 83,000 tons, and 21,000 boats, with a total of 6,000,000 tons, the river flotilla of Russia being quite double that of Germany and Austria combined. The tonnage of goods carried on the rivers and canals of Russia during the first six months of 1895 was greater than that carried on the railways for a whole year, being something like 30,000,000 tons.

With two members of President Cleveland's cabinet, Secretary Lamont and Secretary Carlisle, devoting considerable time to trips throughout the lakes this season, it would seem that there will be less necessity of directing attention to the volume of lake commerce during the coming session of congress. These visits of government officials should be encouraged by the vessel interests. Secretary Carlisle will have an excellent opportunity to judge of the volume of lake business, as he is on the light-house steamer Amaranth, which will visit numerous harbors on both shores of Lake Superior and probably on the lower lakes also.

Referring to the enormous facilities of excursion steamers, ferry boats etc., in New York harbor, the Marine Journal says: "During about eight hours of the morning and early afternoon of Sunday last, the excursion steamers and ferry boats carried from this city, it is calculated, not less than 314,000 persons. This shows that the ordinary facilities for water transportation at this port would be equal to handling a million people in twenty-four hours, and with the extraordinary facilities of ocean steamers and other vessels always readily available as well, the whole population of Manhattan island could be easily carried away in a single day by water, without any necessity of rail travel.

"A Manual of Marine Engineering," by A. E. Seaton, is probably as exhaustive a work on that subject in one volume, as ever published. The illustrations are from working drawings. This is the twelfth edition, and is up to date, a part of the book being devoted to water-tube boilers. The application of theoretical principles to the design and construction of marine machinery is the object of the work. Starting with propulsion there follows chapters on horse power, resistance, machinery space, simple and compound engines, expansion, piston speed and revolutions, and the more important parts of the engines,—condensers, pumps, valve gears and propellers—the latter part of the book being devoted to boilers. It is a book that will be appreciated by ship builders, designers and draughtsmen generally. It can be obtained through the MARINE REVIEW, Cleveland, O. Price is $6.

Tiny Ruth Cleveland will probably christen the United States cruiser Brooklyn, which will be launched during the latter part of this month.

MARINE REVIEW

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,341 vessels, of 1,227,400.72 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons and over that amount on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1894, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,731	843,239.65
Sailing vessels	1,139	302,985.31
Canal boats	386	41,961.25
Barges	85	39,214.51
Total	3,341	1,227,400.72

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
Year ending June 30, 1890	218	108,515.00
" " " 1891	204	111,856.45
" " " 1892	169	45,168.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
Total	872	406,976.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

(From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			SuezCanal.		
	1894.	1893.	1892.	1894.	1893.	1892.
No. vessel pass'ges	14,491	12,008	12,580	3,352	3,341	3,559
T'n'ge, net registd	13,110,366	9,849,754	10,647,203	8,039,106	7,659,068	7,712,028
Days of Navigat'n	234	219	223	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

IT IS understood that when Secretary Lamont of the war department made a lake trip a few weeks ago on one of the Northern line passenger steamers, he caused notes to be made regarding a number of matters pertaining to laws and regulations coming under the direction of the war and treasury departments. One of these was the neglect of vessel masters to answer passing signals. The prompt action of the revenue cutter service in reporting the steamer Australasia and two or three Buffalo vessels for refusal to answer passing signals is probably due to instructions following Secretary Lamont's trip. Captain Patterson, who was in the Australasia when the offense was reported, has since been removed from command of the steamer, but as his removal was not especially on this acconnt, it would be unfair to pass judgement on his case until the matter is fully investigated and settled with the government. It is a fact, however, that many vessel owners have been of the opinion of late that among a certain class of captains the disposition to rush big vessels through narrow channels and ignore in many ways navigation regulations and the rights of other vessels is becoming entirely too common. Engineers engaged in dredging work at the foot of Lake Huron report, for instance, that one captain who was spoken to about interfering with their work when there was no necessity for it, answered with an oath that he knew his business better than it could be taught him. Arbitrary methods in piloting a vessel through the connecting waters of the lakes have always been discouraged by the better class of masters and owners, and if the government authorities are to give special attention to enforcing the rules they will be encouraged in the work.

DRY DOCKS, LIKE grain elevators and other industrial plants that do not involve complications in operation, may be easily united for the benefit of their owners. The danger of competition from the construction of new docks, on account of such combinations, is not so great as it is in manufacturing lines, as new docks are expensive, and there is little difficulty attending the dissolution of the combination and a return to general competition. This feature of the business would tend to deter investors from going into new plants. Then, too, a dock or several docks in a combination might easily be left idle without loss from deterioration of machinery, etc., while sharing in the profits of the pool. These are undoubtedly conditions that have been weighed by the projectors of the New York dry dock trust. Dry dock owners on the lakes have an association and have maintained a fixed schedule of rates for several years past against protests of late from the vessel interests. Promoters of the New York trust offer the companies now owning the docks an annual rental of 2 per cent. per month on their present capital, in return for which the trust is to acquire all the privileges and assume the running expenses of the docks. It is understood that as soon as the combination is effected docking rates in New York are to be advanced 30 per cent.

ENOUGH money has been appropriated by congress to provide, before the close of next season, a 20-foot channel in that part of Ashtabula harbor to which the government gives attention. Upon suggestions from Capt. McKay, of Cleveland, Mayor McKinnon of Ashtabula has urged the city council to take immediate action toward providing funds for dredging in the inner part of the harbor, to which the government gives no attention. A committee has been appointed by the council to take the matter up with the Pennsylvania and Lake Shore railway companies, which control the docks. If funds for dredging the inner harbor are provided by these interests in time to go ahead with the work early next season, Ashtabula will be the first port on Lake Erie to offer deep water at her docks to vessels that are capable of taking advantage of the 20-foot channel, which is to extend throughout the connecting waters of the lakes.

VESSEL OWNERS and admiralty lawyers who are tired of hearing of equal divisions of damages by the federal courts in collision cases will be interested in a case recently decided in the United States circuit court of appeals, fourth circuit. Heretofore in dividing damages in a collision case where both vessels are in fault, the courts have always made an equal division; and so although one of the boats may be in very gross fault, and the other in slight fault, it has not availed the latter in any way, for any fault at all has cast upon her just as much liability as is put on the one grossly at fault. But in the case referred to, which is entitled Victory vs. Plymothian, the court has broken away from that rule, and has imposed a heavier liability on the vessel most at fault. This is thought to be the first case in which this rule has been laid down, at least in the courts of this country. It is probable that the question will go to the supreme court.

EVEN THE shipments of flour from Lake Superior since the opening of navigation are in excess of shipments during the same period last year. St. Mary's Falls canal records show a flour movement to August 1 of 3,540,807 barrels, against 3,360,410 barrels on the same date a year ago. Wheat shipments through the canal to August 1, 1895, aggregated 8,959,991 bushels; on August 1, 1894, the aggregate was 10,832,506 bushels.

UP TO A short time ago unions were unknown in the Lake Superior mining region. Occasionally a little difference of one kind or another occurred between the men and their employers but they were usually local questions; a general strike was unheard of. From the experience of the men a year ago, and again in the present strike on the Marquette range, it does not seem that the unions are of much advantage to them.

ONE important advantage that will result from profits in the pig iron business throughout the country will be the re-establishment of credit among furnacemen. There is no denying the fact that a long period of low prices and actual losses, together with a large number of failures among pig iron manufacturers, had greatly reduced credits.

In General.

Holland is building three fast cruisers of 9,000 horse power each, in which the boilers will be in part of the ordinary tubular type, for cruising at slow speed, and in part Yarrow water tube boilers to be used when high speed is required.

Now it is the German lines that are to build big passenger steamers for their Atlantic trade. It is reported that the Hamburg-American line will very shortly add to its fleet a ship larger than the Campania and Lucania, and that the North German Lloyd Co. will build two ships for their transatlantic and four for their China fleet.

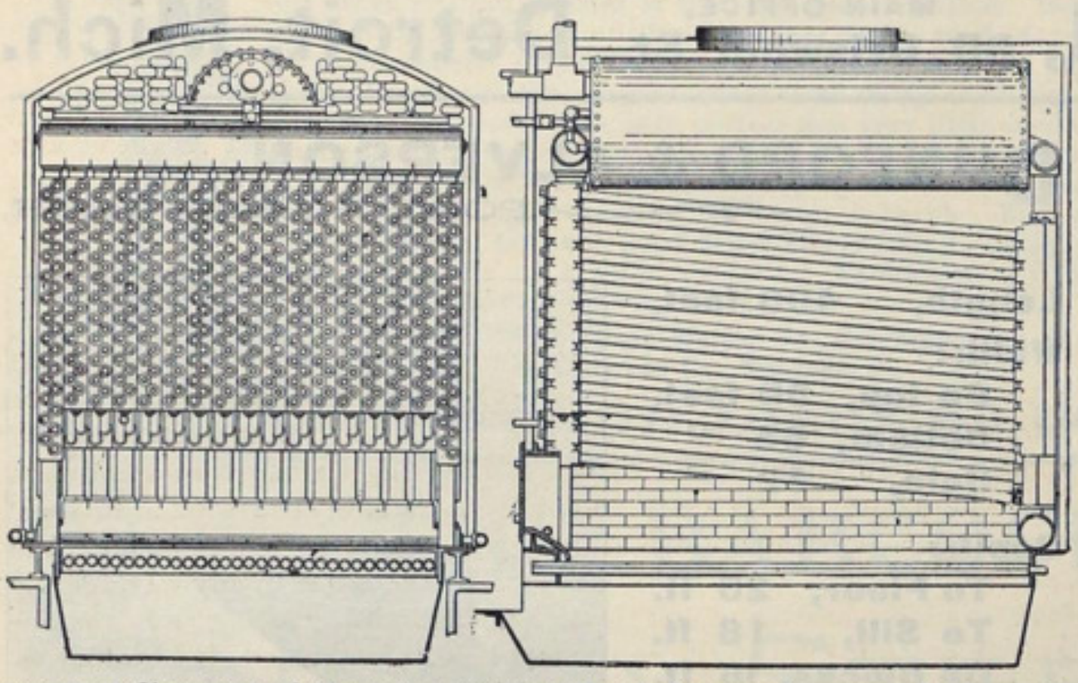
Pumping engines connected with the new dry dock at Southampton, which was opened by the Prince of Wales on Saturday last and which is intended for docking ships like the Atlantic liners St. Louis, Paris and New York, are capable of delivering 540 tons of water per minute. At this rate of pumping the dock is emptied in 2 hours and 15 minutes.

Sinclar Stuart of the United States Standard Register and George R. McDermott, professor of naval architecture at Cornell University, were in Cleveland on the occasion of the closing of the contract, a few days ago, between the Minnesota Steamship Co. and the Chicago Ship Building Co., for two steel schooners. Mr. McDermott is visiting lake ship yards with a view to obtaining a knowledge of the practice of leading builders.

Boiler for High Speed Yachts.

The Gas Engine and Power Co. of Morris Heights, New York city, is probably the largest of the several concerns in this country engaged in the construction of pleasure boats. Its specialty is naphtha launches, but the facilities of the plant are suited to the construction of steam yachts, etc. The company has taken up the construction and sale of the West water tube boiler, a generator which is thought to be specially suited to high speed yachts.

The tubes in this boiler are all straight, of standard size, lap welded charcoal iron, and are formed with a right hand thread at each end. They are so arranged that any one of them may be withdrawn from the front of the boiler without having access to the sides or rear of the boiler. In order to accomplish this, each front header is provided with a boss on its rear side to form the seat for the tube, and on its front side with a boss which affords an opening of greater diameter than the



greatest diameter of the tube, so that the tube may be passed through the opening in the front boss. The opening in the inner boss of the front header is also larger than the tube, which passes through it freely, and one end of the tube is expanded and threaded to fit in this opening. The rear end of the tube is threaded to enter a threaded opening in the rear header. There are, therefore, three openings of different diameters in the headers—that in the rear header of the same size as the tube, that in the rear side of the front header larger than the normal size of the tube, and that in the front of the front header larger than any portion of the tube. The tube is passed in until its two ends enter their respective headers, when it is screwed into place and forms a passage, uniting the front and rear headers. The front opening in the front header is then closed with a screw plug. Any particular tube can be removed and another inserted without disturbing any of the others. The tubes are entirely covered by water when steaming. There are no threaded ends exposed to the fire, and they can be cleaned inside their entire length the same as a fire tube by simply removing the cap nut over each tube on the front of the manifolds. Every tube is of the same length and will interchange in any part of the boiler. The steam drum is of mild steel, of 60,000 pounds tensile strength. The feed coils are of standard redrawn iron pipe, lap weld, having cast steel fittings with easy bends. The jacket is of mild steel with magnesia block filling and is well fastened and riveted, the front portion being made in sections for quick removal. The vertical and horizontal manifolds are of cast steel tested to 1,000 pounds, and the entire boiler is tested to 500 pounds before leaving the works. The feed water enters the feed coils near the top of the jacket in front, passing through a valve of special design, the object of which is to change the flow of the feed water, in case of rupture of the feed coils, to a direct feed to the down flow pipes. Both inlet and outlet are at the front of the boiler, and the coils can be withdrawn entire after removing the top front section of the jacket.

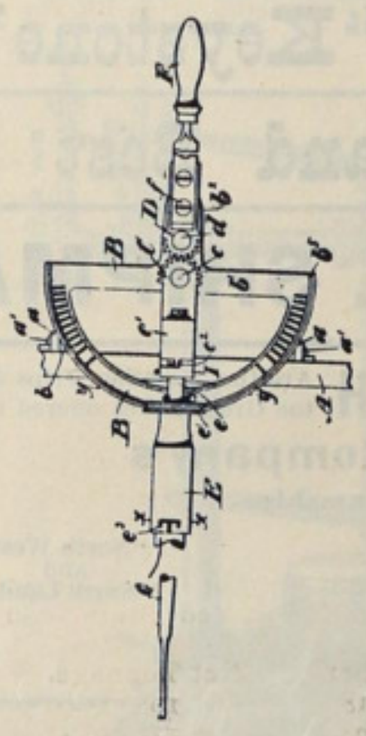
Illustrated Patent Record.

SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM LATEST PATENT OFFICE REPORTS.

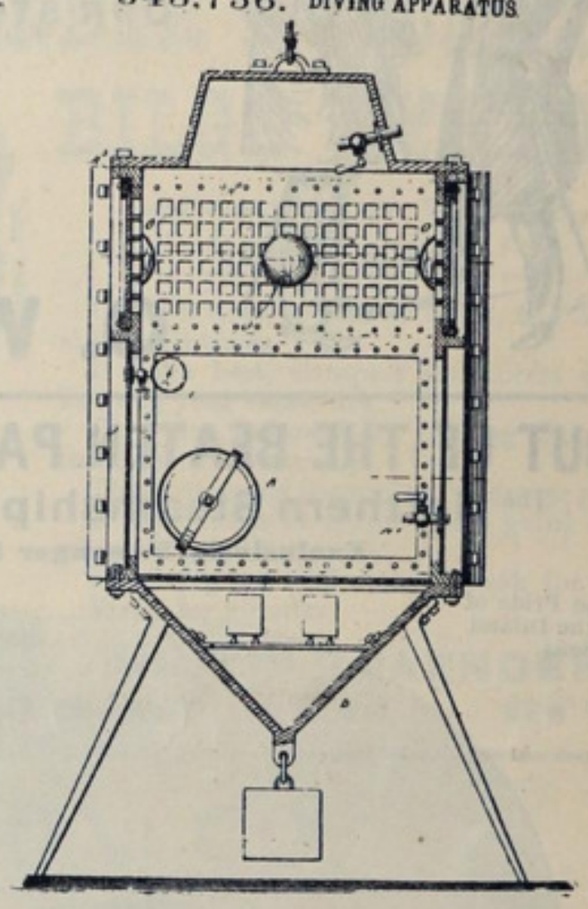
543,650. Bow Facing Oar. Thomas J. Murphy, Cincinnati, Ohio. Filed Feb. 27, 1895. Serial No. 539,851.

Claim—The combination of a semi-circular rocking plate for an oar operating mechanism, having segmental racks at each end, the supports for said plate adapted to be secured to the side of the boat, the intermeshing segmental gears having radially extended arms, said gears being pivoted upon said support, one of said arms provided with a bearing for the shaft of the oar socket and the arm of the opposite segment provided with a seat for the shank of the operating arm, the oar socket having a shaft journaled in the bearing of one of the arms, the grooved wheel fitted upon said shaft to bear upon the semi-circular support, a spring pressed detent, the shaft of which is adapted to slide through the perforation in the shaft of the oar socket, the detent being held with spring pressure upon the semi-circular bearing to engage the toothed segments at each end thereof, for the purpose of turning the oar socket at each end of the stroke for the purpose of feathering the oar and returning it to its working position, and means such as shown to limit the feathering motion of the oar socket.

543,650. BOW-FACING OAR



543,756. DIVING APPARATUS



543,756. Diving Apparatus. Hubert Schon, Allegheney, Pa., assignor to himself, Anton Lutz and George Muth, same place. Filed June 10, 1895. Serial No. 552,320.

Claim—A diving apparatus, comprising a casing provided with side frames having flanges bolted together, panels set and fastened in the said frames, and electric lights held in the said casing, and adapted to shed their light through the said panels, to permit the occupants of the apparatus to observe the surrounding water and objects therein.

The American Ship Windlass Co., manufacturers of the steam towing machines that have been adopted on all steel tow barges built on the lakes of late, have just received an order from the Philadelphia & Reading Railway Co. for two more of the machines, similar to the one they now have on the steam collier Lebanon. The company has assurance from the lakes of three or four orders to be placed within thirty days.

U. S. ENGINEER OFFICE, 34 Congress St., Detroit. Mich., August 7, 1895. Sealed proposals for furnishing all labor, materials and appliances, for (A) removing shoals from west approach, St. Marys Fall's canal; (B) removing shoals from east approach, St. Mary's Fall's canal; (C) removing shoals off Six Mile Point. Hay Lake; and (D) removing shoal 29, section 4, ship channel, etc., will be received here until 2 p. m., September 6, 1895, and then publicly opened. All information furnished on application O. M. POE, Col., Engrs.,

Sept. 1.

OFFICE OF LIGHT-HOUSE ENGINEER, 9th and 11th Distric s. Detroit, Mich., August 1, 1895. Proposals will be received at this office until 3 o'clock p. m. of Monday, the 12th day of August 9, 1895, for furnishing twenty-two ten-inch steam fog whistles for eleven fog signal stations in the 7th and 11th Light-house Districts, delivered at the Light-house, depot Detroit, Michigan. Plans, specifications, forms of proposal and other information may be obtained on application to the undersigned. The right is reserved to reject any or all bids and to waive any defects. M. B. Adams, Major, corps of Engineers, U. S. A., Light-house Engineer.

Aug 8.

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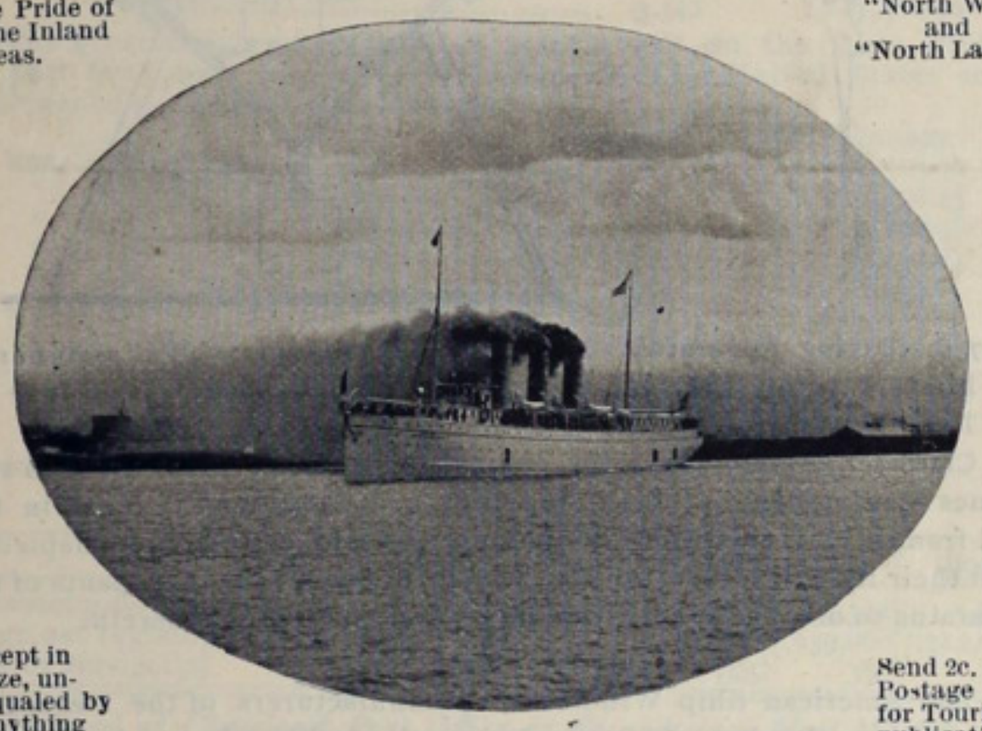

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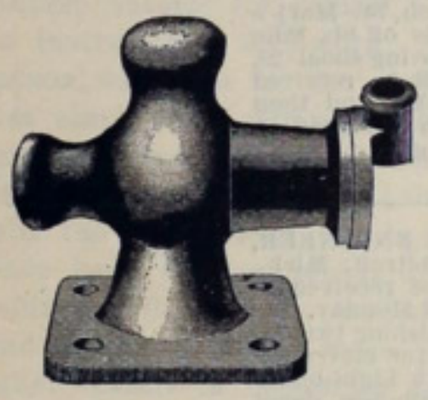

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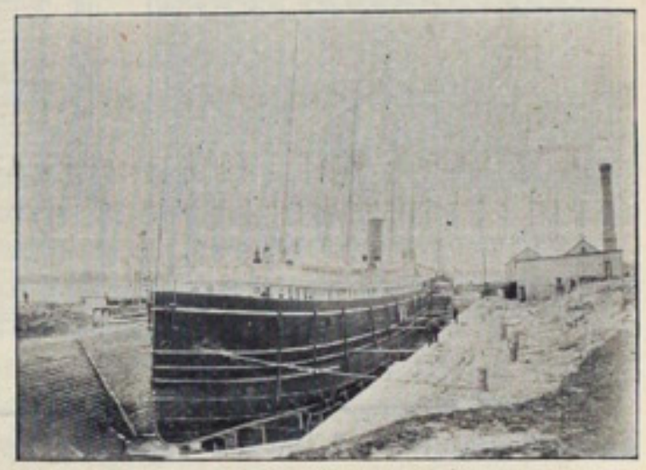
Length, 400 feet,

Width:
On top, 95 feet,
Bottom, 55 "
Gate, 62 "

Depth:
To Floor, 20 ft.
To Sill, 18 ft.
On Blocks, 16 ft.



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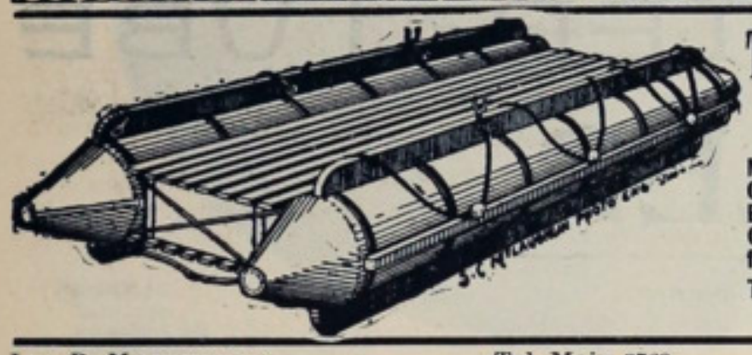

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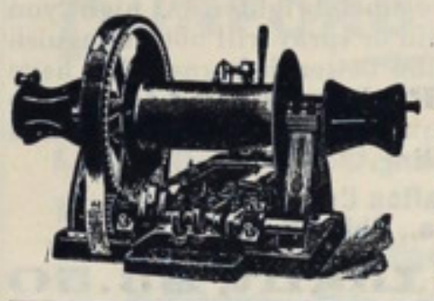

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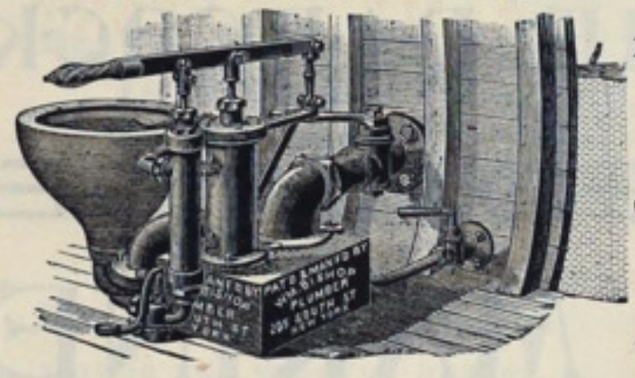

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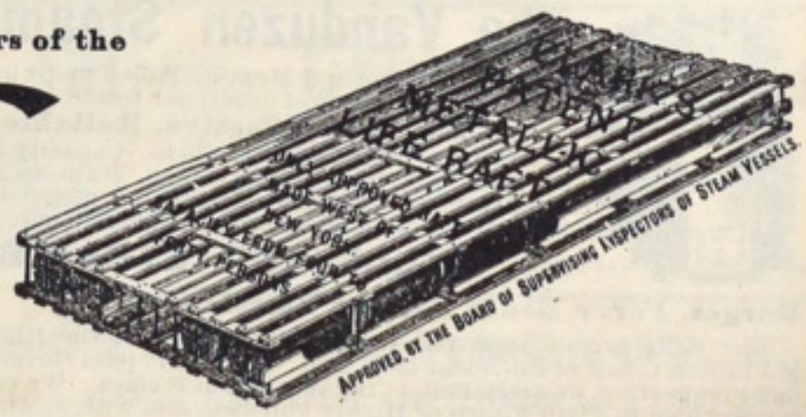

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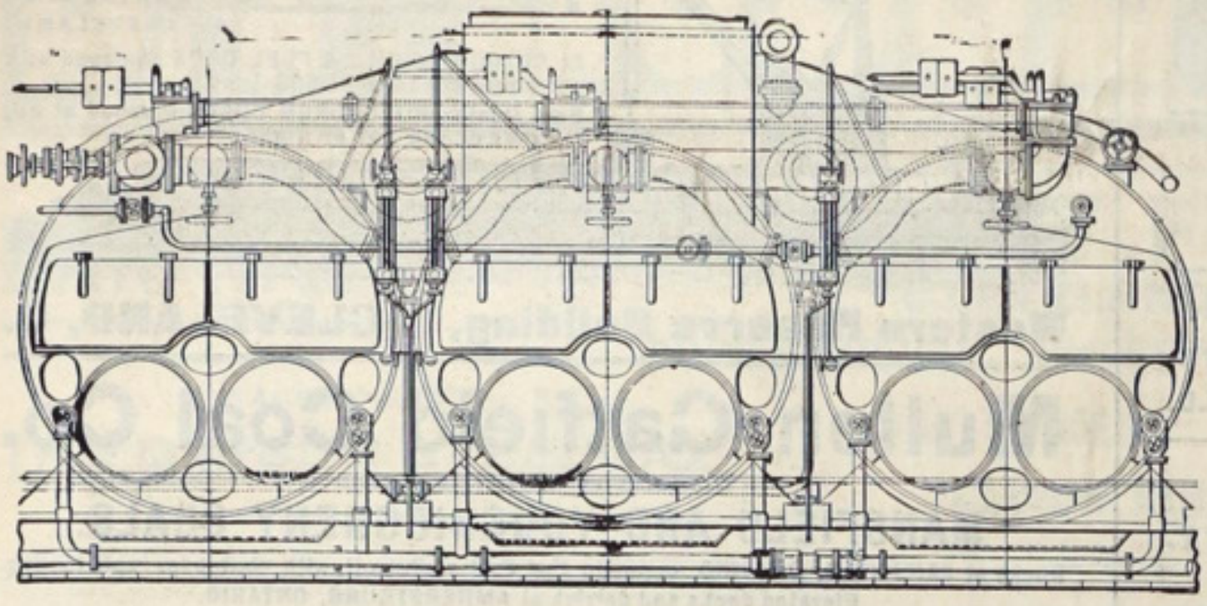

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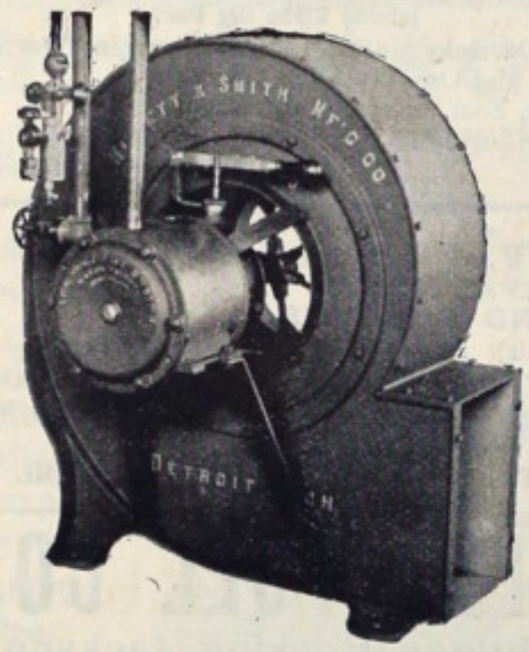

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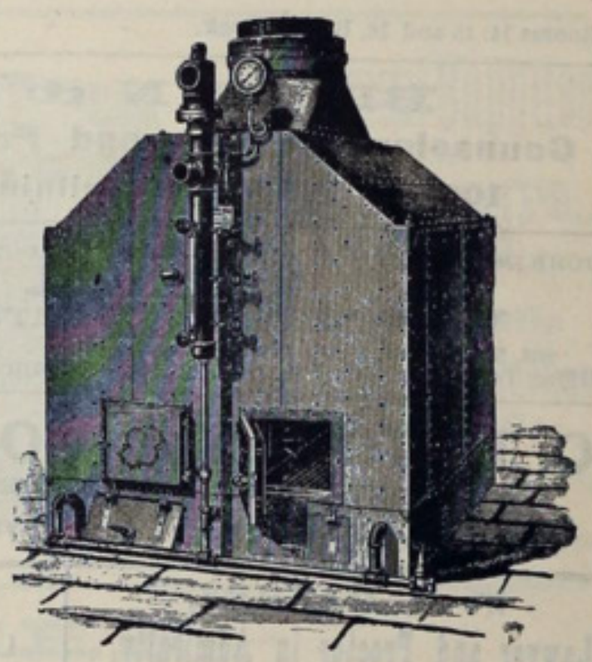

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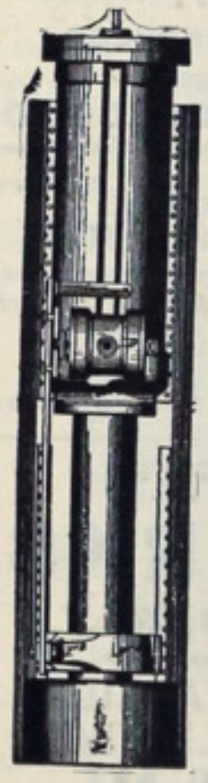

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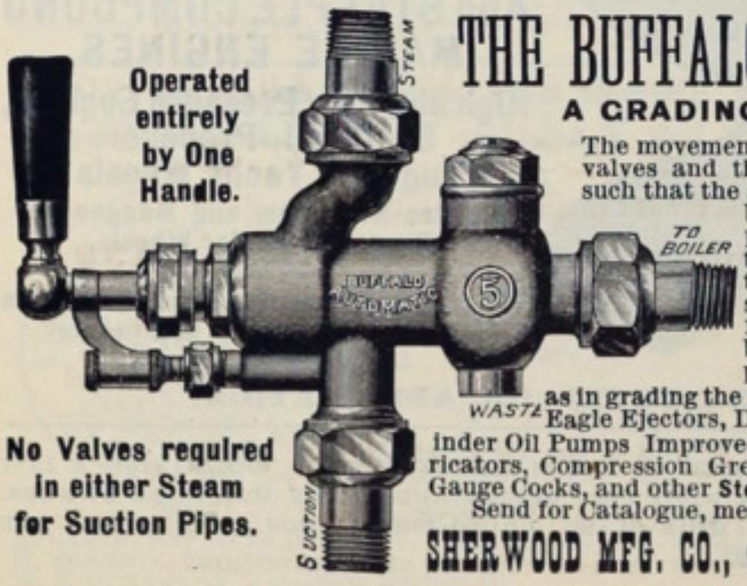

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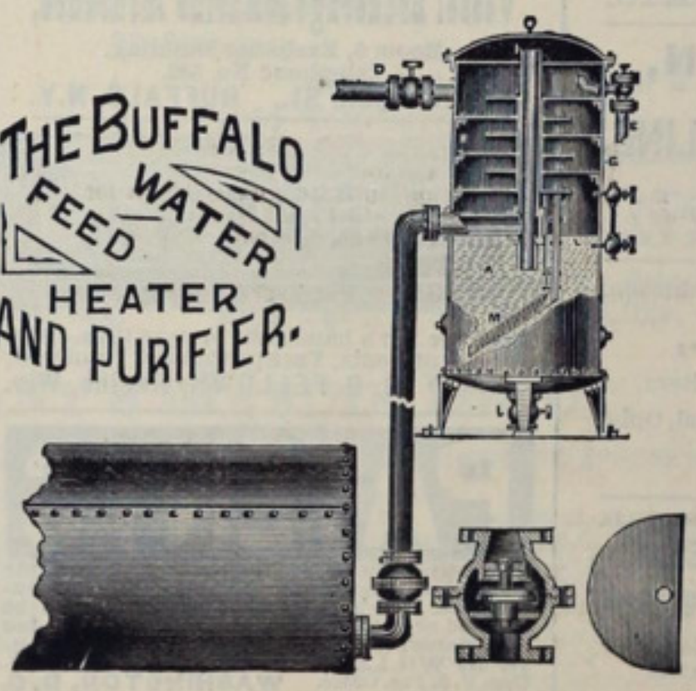

REFERENCES.

A.—Settling chamber.
B.—Boiler.
C.—Feed pipe to boiler.
D.—Steam pipe.
E.—Water supply pipe.
F.—Check valve.
G.—Spray disks.
H.—Spray chamber.
I.—Equalizing tube.
J.—Blow-off pipe.
K.—Automatic shut-off valve.
L.—Division plate.
M.—Deflecter and separator.

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